

Remarks/Arguments

Reconsideration and allowance of the above application, in view of the following amendments and remarks, is respectfully requested. Claims 1-15 and 20-30 are pending in the application. Claims 1-15 and 20-30 stand rejected. Claims 16-19 and 31-33 have been withdrawn. In the present Amendment, claims 1, 5, 11, 13 and 26-29 have been amended. No new matter has been introduced into the present application by the present amendments.

Rejections Under 35 U.S.C. § 112

Claims 2-5, 11, 13, 20-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. In particular, the Examiner questioned the basis of the term “mEq.” A definition of mEq is given in the present application on page 9, line 28-29 as milliequivalents of phosphorous groups per gram of polymer. In more general terms, 1 mEq of a functional group or a polymer segment per gram of final polymer is defined as 1 millimole of the functional group or polymer segment per gram of the final polymer. In addition, the Examiner found the term “average molar mass” to be indefinite and recommended standard terms such as Mw or Mn. Applicants have amended the claims accordingly and replaced “average molar mass” with molecular weight (Mw). This method of measurement is found on page 10, line 18-19, because the cited methods, light scattering or vapor pressure osmosis, lead to Mw values. Finally, the Examiner rejected claim 13 because the claim term “P” was not specifically disclosed within the claim. Applicants have now amended claim 13 to include the term “P,” and the positional relationship of P, in terms of the polymer produced by the claimed process.

Rejections Under 35 U.S.C. § 102

Claims 1, 7-10, 12, 14, and 30 were rejected as allegedly anticipated by U.S. Patent 4,950,712 (Letourneur). Applicants respectfully traverse this rejection.

The Examiner cites Letourneur as teaching a combination of polystyrene crosslinked with dextran, wherein the functional linkages of the base polymer are substituted with phosphate residues and phospholipids. See col. 1, line 30 to col. 6, line 44. Applicants have amended claim 1 to explicitly exclude crosslinking using either the polymer component P or the

oligomeric/polymeric segment U. The applicants respectfully submit, therefore, that the present invention does not claim any of the resin or polymer combinations disclosed in Letourneur.

Claims 1-8, 11-12, 14-15, 20-30 are rejected as allegedly anticipated by EP 0 238 853 (Fong). Applicants respectfully traverse this rejection.

The Examiner cites Fong as teaching a process for producing phosphonated polymers via a transamidation between acrylamide co-polymers and a chemical reactant. See p. 2, line 20-28. Applicants have amended claim 1 to exclude polymers wherein the polymer component P is not a polyacrylate nor a polyamideacrylate. The applicants respectfully submit, therefore, that the present invention does not claim any of the resin or polymer combinations disclosed in Fong.

Rejections Under 35 U.S.C. § 103

Claims 2-5, 11, 20-29 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Letourneur. Applicants respectfully traverse this rejection and request withdrawal thereof for at least the reasons set forth below.

Applicants respectfully submit that no *prima facie* case of obviousness has been established with regard to the now amended claim 1 and its dependents. As the Examiner is aware, a *prima facie* case of obviousness requires the following: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP at 2143. Applicants submit that one or more of these criteria have not been met.

With regard to the first criterion, Letourneur fails to provide any motivation to modify the reference to try to arrive at the invention recited in each of the present claims. As noted above, Letourneur does not teach or suggest polymers having phosphorous-containing groups that are not crosslinked. In addition, Letourneur does not teach or suggest the use of polymers having phosphorous-containing groups as a means to enable stable immobilization of the polymer onto a waveguide surface as explained on page 9, line 22-24 and page 11 line 24-26 of the present application.

The action alleges that the elements of Letourneur, combined with the knowledge of an artisan of routine skill, in pursuit of molecular recognition polymers (chromatography), would suggest that the present invention would be “readily envisaged by one skilled in the art in light of the common endeavor between the prior art and the instant invention.” This hindsight analysis, however, does not establish a *prima facie* case, as motivation to modify must be found in the reference. The Examiner has provided no evidence as to why one skilled in the art would be motivated to attempt to modify the teachings of Letourneur into the present invention. A statement that modifications of the reference to meet the claimed invention allegedly would have been “obvious to the ordinary artisan at the time the invention was made” because the references relied upon allegedly teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. (MPEP 2143.01). The question is not whether the combination of Letourneur’s teachings and an artisan of routine skill are capable of performing the claimed invention, but rather if the reference or prior art collectively teach or suggest the claimed phosphorus-containing polymers. It is respectfully submitted that there is no such motivation.

Additionally, the second prong of the obviousness analysis requires that the references provide a reasonable expectation of success if the modification is in fact made, which Letourneur does not provide. The reasonable expectation of success must be found in the prior art, not in the Applicant’s disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). There is no indication in Letourneur that would lead one to conclude that there was a reasonable expectation of successfully translating Letourneur into phosphorus-containing polymers for coating dielectric surfaces. The success of the combination could not be established until the Applicants reduced the combination to practice. The unpredictable nature of polymer chemistry and in particular their coating properties weigh heavily in favor of non-obviousness. One skilled in the art has no way of knowing what combination of compounds will have a desired effect on any given substrate. One cannot, therefore, simply combine known polymers and expect the desired anchoring of polymers on, for example, a waveguide surface. The claimed proportions and molecular weights of the polymers have inventively been found to achieve this function. In Letourneur, the purpose of the phosphorous containing groups within the polymer was to mimic

a DNA or phospholipids with the result that analytes from solution directly recognize the phosphorous containing groups, i.e. bind to them. This does not happen within the presently claimed polymers. Summarizing the above, no mention is found in the prior art which leads to the presently claimed compositions as a solution for the purpose of immobilizing. For these reasons, the present invention is not *prima facie* obvious over Letourneur individually or in combination with any other reference or inherent knowledge.

The third prong of the obviousness analysis requires that the combination of the references teach or suggest all of the claim limitations. It is respectfully submitted that the Examiner has provided no discussion or reasoning of how Letourneur meets each and every limitation of the present claims.

In summary, the Examiner fails to make a case of anticipation of the present invention because the Examiner cites Letourneur as teaching the combination of polystyrene crosslinked with dextran, wherein the functional linkages of the base polymer are substituted with phosphate residues and phospholipids. The compounds of the present invention are not inclusive of the crosslinked polymers and the applicants have amended independent claim 1 to explicitly remove crosslinking from consideration. The applicant, therefore, does not claim any of the polymers disclosed in Letourneur and therefore Letourneur does not anticipate the claimed invention.

Likewise, the Examiner cites Fong as teaching a process for producing phosphonated polymers via a transamidation between acrylamide co-polymers and a chemical reactant. Applicants have amended claim 1 to exclude polymers wherein the polymer component P is not a polyacrylate nor a polyamideacrylate. The applicant, therefore, does not claim any of the polymers disclosed in Fong and therefore Fong does not anticipate the claimed invention.

The Examiner also fails to make a case of obviousness in view of Letourneur. First, Letourneur fails individually or in combination to motivate one skilled in the art to arrive at the claimed invention. Specifically, Letourneur discloses crosslinked polymers that fail to provide evidence as to why one skilled in the art would be motivated to attempt to modify the separate teachings of Letourneur into the present invention. Thus, there is no *prima facie* obviousness. Second, the Examiner has not demonstrated a reasonable expectation of successfully translating Letourneur into a phosphorus-containing polymer comprising the claimed polymer components. The Examiner has effectively acknowledged that Letourneur does not teach the elected

invention. Without some identifiable suggestion or teaching of the claimed combination there can be no expectation of success in a field currently as unpredictable as the polymer coating field. Thus, the present invention is not obvious over Letourneur.

Overall, the present invention possesses significant patentable features that Letourneur does not teach or suggest. All of the present claims define patentable subject matter such that this application should be in condition for allowance. Early and favorable action on the merits of the present application is thereby requested.

Enclosed please find a check for \$110.00 for an extension of one month.

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Respectfully submitted,

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